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*Acanthobrama hadiyahensis*,  
A New Species  
of Cyprinid Fish  
from Saudi Arabia

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Brian W. Coad,  
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***ACANTHOBrama HADIYAHENSIS*,  
A NEW SPECIES OF CYPRINID FISH  
FROM SAUDI ARABIA**

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## Abstract


A new species of cyprinid fish, *Acanthobrama hadiyahensis*, is described from Wadi Hadiyah, Saudi Arabia, in the coastal drainage of the Red Sea, a major extension in range for the genus. The new species is characterised by 17–19 total gill rakers on the first arch, mouth angle 40° or less with the horizontal, lateral line scales 54–58, branched dorsal fin rays 7, branched anal fin rays 14–17, and total vertebrae 38–39. It appears to be most closely related to *Acanthobrama telavivensis*, a Levant species.

## Résumé

On décrit une nouvelle espèce de la famille des cyprinidés, *Acanthobrama hadiyahensis*, provenant de Wadi Hadiyah, Saudi Arabia, dans le bassin côtier de la mer Rouge. Ceci est une extension importante à l'aire de répartition de ce genre. Cette nouvelle espèce se caractérise par un nombre total de 17–19 branchicténies sur le premier arc, l'angle de la bouche de 40° ou moins de l'horizontale, 54–58 écailles à la ligne latérale, la nageoire dorsale ayant 7 rayons divisés, la nageoire anale ayant 14–17 rayons divisés, et un nombre total de 38–39 vertèbres. Son plus proche parent semble être *Acanthobrama telavivensis*, une espèce du Levant.

## **Acknowledgements**

We would like to thank Dr. D.E. McAllister, National Museum of Natural Sciences, Ottawa for his helpful comments on the manuscript. Figure 1 was drawn by C.H. Douglas, Vertebrate Zoology Division, National Museum of Natural Sciences, Ottawa.



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## Introduction

The cyprinid genus *Acanthobrama* Heckel is characterised by: a thickened and smooth last unbranched dorsal fin ray; a naked ventral keel on the belly between the anus and the pelvic fins; a single row of pharyngeal teeth on each side (5-5 or 5-4); 51-108 scales in the lateral line; 9-21 branched rays in the anal fin; and scales without radii on the anterior field. The five previously known species of this genus are found in the Tigris-Euphrates basin and drainage basins of the Levant and Cilicia.

Goren et al. (1973) revised the genus to exclude *A. terraesanctae* Steinitz which was made the type of a new genus, *Mirogrex* Goren, Fishelson and Trevas, distinguished principally by a more slender form and a higher count of the gill rakers (mostly 20-28 compared to 12-15 in *Acanthobrama*), adaptations to a planktonic diet in Lake Tiberias (= Yam Kinneret) and Lake Huleh of the Jordan River Basin.

This paper describes a sixth new species, *Acanthobrama hadiyahensis*, from the area of Khaybar and Hadiyah, Saudi Arabia, in waters which lie in the coastal drainage of the Red Sea, a major extension in range for the genus of about 800 km.

## Materials and Methods

The description is based on the holotype and ten paratypes collected in two localities, Ain (= spring) Aljmyma and Wadi (= watercourse) Hadiyah, by one of us (H.F. Alkahem) during 1977 and 1981. Ain Aljmyma lies in the Wadi Hadiyah basin but is isolated from the wadi itself. A twelfth specimen was too small and dried to be useful. Some specimens were too small to enable accurate counts to be made and others had damaged fin rays so that sample sizes vary for each character examined.

The holotype is deposited in the National Museum of Natural Sciences, Ottawa (NMC), and the three paratype collections are evenly divided between NMC and H.F. Alkahem (who intends to deposit his half of the material in the King Saud (= Riyadh) University, Riyadh, Saudi Arabia).

Counts and measurements follow Hubbs and Lagler (1958) except that unbranched (Roman numerals) and branched (Arabic numerals) fin rays are counted separately. The first caudal vertebra is taken to be the one lying immediately posterior to the first proximal pterygiophore of the anal fin since the first complete haemal spine is not readily distinguishable on radiographs. The four Weberian vertebrae and the urostylar centrum are included in the counts. All measurements were made to the nearest 0.1 mm under a binocular microscope.

### *Acanthobrama hadiyahensis*

#### Figure 1

### Holotype

A female, 64.5 mm standard length (SL), NMC82-0110A, Wadi Hadiyah, near Hadiyah, Saudi Arabia. ca. 25°33'N, 38°44'E. 3 June 1981. H.F. Alkahem.

### Paratypes

5 specimens, 44.3-76.3 mm SL, NMC82-0110B, same locality as the holotype. 3 specimens, 28.0-50.1 mm SL, NMC82-0359, Ain Aljmyma, about 3 km northwest of Khaybar City. 1981. H.F. Alkahem (a fourth specimen from this collection is small and dried and is not included as a paratype and was not counted or measured). (Khaybar is at 25°42'N, 39°31'E). 2 specimens, 36.9-38.1 mm SL, NMC82-0363, Ain Aljmyma, about 3 km northwest of Khaybar City. 27 July 1977. H.F. Alkahem.

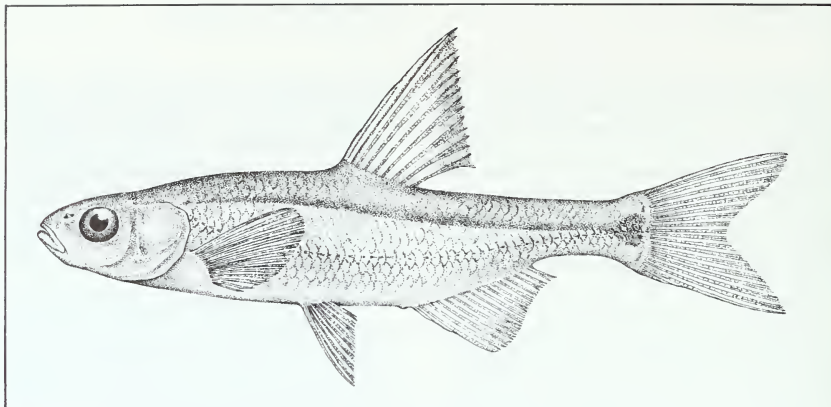


Figure 1. Holotype of *Acanthobrama hadiyahensis*, female, 64.5 mm SL.

### Diagnosis

*Acanthobrama hadiyahensis* is distinguished from all other species in the genus (including *A. terraesanctae*) by the following combination of characters: gill rakers on whole first arch 17–19; mouth angle with horizontal  $40^\circ$  or less; lateral line scales to hypural fold 54–58; branched dorsal fin rays 7; branched anal fin rays 14–17; pharyngeal tooth counts 5-5 or 6-5; and total vertebrae 38–39.

### Description

The general body shape is shown in Figure 1. The dorsal fin origin lies posterior to the pelvic fin origin. The anal fin origin lies at, slightly in advance of, or slightly behind the dorsal fin insertion. The pectoral and pelvic fins extend beyond the pelvic and anal fin origins, respectively, in members of both sexes but not all individuals. The postcleithra are short. The last unbranched dorsal fin ray tapers gradually from a smooth, rigid, thickened basal portion to a flexible, thin distal portion. This ray is broken in all but one of the specimens at hand where the rigid portion is about 72% of the total ray length. The distinction between rigid and flexible portions is difficult to assess because the ray tapers gradually but the rigid portion is estimated to be about 16–20% of SL in fish 64.5–76.3 mm SL. The caudal fin is moderately forked and the dorsal and anal fin margins are concave.

Scales are evenly distributed over the body except on the belly between the pelvic fins base and the anus where there is a naked keel. This keel is formed by a

fleshy protrusion of the belly in the absence of a median row of scales. There is no pelvic axillary scale. Radiums are restricted to the posterior field.

The mouth is terminal or slightly subterminal, oblique and at an angle of  $34\text{--}40^\circ$  (mean =  $37^\circ$  in five adults) to the horizontal axis of the body. Gill rakers are short, less than half the length of those in *A. terraesanctae* of comparable standard length. Pharyngeal teeth are hooked with little or no serrations below the hook (cf. Fig. 6B in Goren et al., 1973). The gut is short and S-shaped. The peritoneum is dark but not completely black due to numerous but not contiguous melanophores.

In the following counts the value for the holotype is indicated by an asterisk. Dorsal fin rays III,7 (11 specimens)\*, anal fin rays III,14(3)\*, III,15(3), III,16(3), III,17(1); pectoral fin rays I,13(3), I,14(6)\*, I,15(1); pelvic fin rays 1,7(1), 1,8(7)\*, 1,9(3); branched caudal fin rays 17(10)\*; lateral line scales 54(2), 56(3), 57(3)\*, 58(1); scales above lateral line 11(7)\*, 12(1), scales below lateral line 5(6)\*, 6(3); scales between lateral line and pelvic fin 4(1), 5(5)\*, 6(3); scales around caudal peduncle 20(2), 21(4), 22(2)\*; total gill rakers on whole, first arch 17(4), 18(3), 19(3)\*; pharyngeal teeth 5-5(8)\*, 6-5(3); precaudal vertebrae 19(10)\*, 20(1); caudal vertebrae 19(7)\*, 20(4); and total vertebrae 38(6)\*, 39(5). Total vertebrae are uniformly 39 for Ain Aljymya specimens and 38 for Wadi Hadiyah specimens and may reflect differing temperature regimes at these two localities. There are no evident differences

in other characters between these two localities although it should be borne in mind that the sample sizes are small.

In the following measurements the value for the holotype is given in brackets after the mean. Head length (HL) in standard length (SL) 3.8–4.3 (mean = 4.0) [4.0], head depth in SL 5.3–5.9 (5.6) [5.6], head depth in HL 1.0–1.5 (1.4) [1.4], body depth in SL 3.8–4.9 (4.3) [4.4], head width in SL 7.8–8.7 (8.2) [7.8], predorsal length in SL 1.9–2.0 (2.0) [2.0], prepelvic length in SL 2.2–2.4 (2.3) [2.3], head width in HL 1.9–2.0 (2.0) [1.9], lower jaw length in HL 2.6–3.0 (2.8) [3.0], lower jaw length in SL 10.0–12.4 (11.3) [11.9], snout length in HL 3.6–4.3 (3.9) [3.7], eye diameter in HL 2.8–3.5 (3.1) [3.4], interorbital distance in HL 3.1–3.5 (3.3) [3.4], postorbital length in HL 2.0–2.5 (2.2) [2.1], pectoral fin length in HL 1.2–1.3 (1.2) [1.2], pelvic fin length in HL 1.3–1.5 (1.4) [1.4], longest dorsal fin length in HL 0.8–1.1 (1.0) [0.9], longest anal fin ray length in

HL 1.5–1.7 (1.6) [1.5], caudal peduncle depth in caudal peduncle length 1.9–2.3 (2.1) [2.1], pectoral fin length in distance between pectoral and pelvic fin origins 0.9–1.0 (1.0) [1.0], pelvic fin length in distance between pelvic and anal fin origins 0.9–1.2 (1.0) [1.0], and longest anal fin ray length in longest dorsal fin ray length 1.4–1.8 (1.6) [1.5].

A dark, mid-lateral band is developed posteriorly becoming diffuse near the head. The mid-line of the back is evidently darker than the upper flanks but a clearly defined median line is not present. Fin pigmentation is concentrated on the rays as melanophores. The fin membranes are clearer with the exception of the basal portions of the dorsal fin which have scattered melanophores.

### **Etymology**

The specific name *hadiyahensis* is taken from the name of the wadi in the drainage of which all the known specimens of this species have been caught.

## Discussion

The new species is the first to be described within the genus *Acanthobrama sensu lato* (including *Mirogrex*) from an area outside the Levant and the Tigris-Euphrates basins which share a number of genera and species of fishes and are zoogeographically related (Por, 1975). Khaybar is about 800 km from the nearest reported distributions of other *Acanthobrama* species in the coastal drainages of the Levant to the northwest and the Euphrates River to the northeast (Figure 2). Some of the freshwater cyprinid species of the Red Sea drainages of the Arabian peninsula are related at the generic level to those of the Levant and Banister and Clarke (1977) suggest that this presupposes fish movements between Arabia and the Levant. A recent report (Krupp, 1982) has shown a relationship at the species level with the cyprinid *Garra tibanica* being found both at Khaybar and as a distinct subspecies in the southern Dead Sea Valley.

Only a single species of *Acanthobrama*, *A. marmid*, is recognised from the Tigris-Euphrates basin while four species are described from the southern Levant (if *Mirogrex terraesanctae* is regarded as an *Acanthobrama*). Two of the Levant species (*A. lissneri* and *A. telavivensis*) share with our new species a modal count of 7 branched dorsal fin rays, relatively small size (< 113 mm SL), and vertebral counts which lie at the upper end of the range for one species (*A. telavivensis*) and the lower end for the other

species (*A. lissneri*). The new species appears to be most closely related to *A. telavivensis* which has a similar range in lateral line scale number (51–60) and a similar shape of pharyngeal teeth. However, it may be readily distinguished by higher total numbers of gill rakers (17–19 in *A. hadiyahensis*, maximum 15 in *A. telavivensis*) and higher number of branched anal rays (14–17 in *A. hadiyahensis*, 11–13 in *A. telavivensis*).

In total number of gill rakers (17–19) the new species is intermediate between *Acanthobrama* (12–15) and *Mirogrex* (20–28). There seems little utility in recognising a monotypic genus on the basis of adaptations to a planktonic diet expressed only as mouth angle and shape and number of gill rakers in these closely related species with a distribution restricted to the Middle East. It may be pertinent to note that *A. centisquama* could equally be recognised as forming a monotypic genus since it is uniquely characterised by the absence of scale radii, high lateral line scale counts (82–108), and a high branched anal ray count (18–21). We regard *Mirogrex* as a synonym of *Acanthobrama*. We also prefer to retain the genus *Acanthobrama* as distinct from other Eurasian cyprinid genera in contrast to Howes (1981) who has recently suggested on osteological grounds that this genus shares apomorph characters with *Rutilus sensu stricto*.

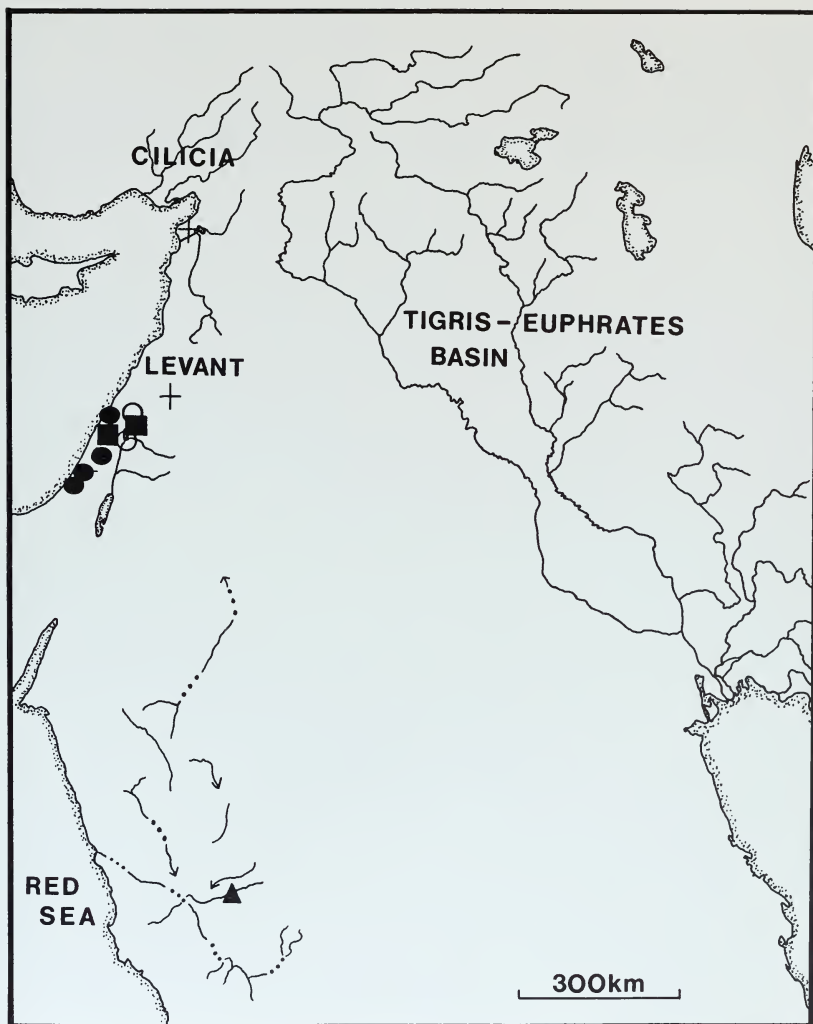


Figure 2. Simplified drainage map of the Middle East. ▲ = Type locality of *Acanthobrama hadiyahensis*; + = *A. centisquama*; ■ = *A. lissneri*; ● = *A. telavivensis*; ○ = *A. terraesanctae*. *A. marmid* is found throughout the Tigris–Euphrates basin and in drainages of Cilicia.

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